Wall must move outward to have 'active pressure'

Soil Fails if shears along the Failure plane

\[ \gamma = \text{Soil unit wt} \]
\[ \phi = \text{Effective friction angle} \]

\[ F_s = \frac{1}{2} k_a g \sigma_s x^2 \]

\[ \alpha_e = 45^\circ - \phi / 2 \]

For Rankine Active Case

- If the wall is restrained, At-rest pressure will occur.
  - The threshold varies by reference standard generally.
  - If the wall can tolerate 0.001H - 0.008H
    Active pressure can be used.

Rankine for No Backslope

- Active Failure Plane \( \alpha_e = 45^\circ - \phi / 2 \)

- Passive \( \alpha_e = 45^\circ + \phi / 2 \)

\( k_a = \tan(45^\circ - \phi / 2) \)
\( k_p = \tan(45^\circ + \phi / 2) \)

Coulomb Theory - accounts for wall behavior...